



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

2834
RECEIVED
AUG 10 2001

In re application of: Pelrine, et al.

Attorney Docket No.: SRI1P029

Application No.: 09/779,373

Examiner: To Be Advised

Filed: February 7, 2001

Group: 2834

Title: ENERGY EFFICIENT ELECTROACTIVE POLYMERS AND ELECTROACTIVE POLYMER DEVICES

#4/IDS
Hawkins
10/11/01

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail to: Commissioner for Patents, Washington, DC 20231 on August 7, 2001.

Signed: 
Deborah Neill

**INFORMATION DISCLOSURE STATEMENT
37 CFR §§1.56 AND 1.97(b)**

Commissioner for Patents
Washington, DC 20231

Dear Sir:

The references listed in the attached PTO Form 1449, copies of which are attached, may be material to examination of the above-identified patent application. Applicants submit these references in compliance with their duty of disclosure pursuant to 37 CFR §§1.56 and 1.97. The Examiner is requested to make these references of official record in this application.

This Information Disclosure Statement is not to be construed as a representation that a search has been made, that additional information material to the examination of this application does not exist, or that these references indeed constitute prior art.

This Information Disclosure Statement is: (i) filed within three (3) months of the filing date of the above-referenced application, (ii) believed to be filed before the mailing date of a first Office Action on the merits, or (iii) believed to be filed before the mailing of a first Office Action after the filing of a Request for Continued Examination under §1.114. Accordingly, it is

believed that no fees are due in connection with the filing of this Information Disclosure Statement. However, if it is determined that any fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. SRI1P029).

Respectfully submitted,

BEYER WEAVER & THOMAS, LLP



William J. Plut

Limited Recognition Under 37 C.F.R. §10.9(b)

P.O. Box 778
Berkeley, CA 94704-0778

Form 1449 (Modified)

Information Disclosure
Statement By Applicant

(Use Several Sheets if Necessary)

Atty.Docket No.

SRI1P029

Applicant:

Pelrine, et al.

Filing Date

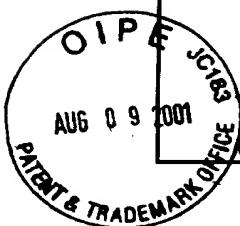
02/07/01

Application No.:

09/779,373

Group

2834



U.S. Patent Documents

Examiner Initial	No.	Patent No.	Date	Patentee	Class	Sub-class	Filing Date
	A	6,048,622	04/11/00	Hagood, et al.			02/09/99
	B	5,915,377	06/29/99	Coffee			01/24/97
	C	5,902,836	05/11/99	Bennet, et al.			08/23/95
	D	5,835,453	11/10/98	Wynne, et al.			05/05/97
	E	5,642,015	06/24/97	Whitehead, et al.			05/01/95
	F	5,430,565	07/04/95	Yamanouchi, et al.			06/02/93
	G	5,254,296	10/19/93	Perlman			11/13/91
	H	5,250,784	10/05/93	Muller, et al.			10/24/91
	I	5,229,979	07/20/93	Scheinbeim, et al.			12/13/91
	J	5,024,872	06/18/91	Wilson, et al.			08/13/87
	K	4,969,197	11/06/90	Takaya			02/21/89
	L	4,885,783	12/05/89	Whitehead, et al.			04/10/87
	M	4,843,275	06/27/89	Radice			01/19/88
	N	4,518,555	05/21/85	Ravinet, et al.			06/14/83
	O	4,401,911	08/30/83	Ravinet, et al.			03/02/81
	P	4,400,634	08/23/83	Micheron			12/09/80
	Q	4,384,394	05/24/83	Lemonon, et al.			05/13/81
	R	3,403,234	09/24/68	Barnes, Jr.			09/11/64

Foreign Patent or Published Foreign Patent Application

Examiner Initial	No.	Document No.	Publication Date	Country or Patent Office	Class	Sub-class	Translation	
							Yes	No
S	WO 01/06575	01/25/01	PCT				X	
T	WO 98/35529	08/13/98	PCT				X	
U	WO 95/08905	03/30/95	PCT				X	

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	V	Ajluni, Cheryl, "Pressure Sensors Strive to Stay on Top, New Silicon Micromachining Techniques and Designs Promise Higher Performance", <i>Electronic Design – Advanced Technology Series</i> , October 3, 1994, pp. 67-74
	W	Anderson, R. A., "Mechanical Stress in a Dielectric Solid From a Uniform Electric Field", <i>The American Physical Society</i> , 1986, pp. 1302-1307
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified)

Information Disclosure
Statement By Applicant

(Use Several Sheets if Necessary)

Atty Docket No.

SRI1P029

Application No.:

09/779,373

Applicant:

Pelrine, et al.

Filing Date

02/07/01

Group

2834



Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	X	Aramaki, S., S. Kaneko, K. Arai, Y. Takahashi, H. Adachi, and K. Yanagisawa. 1995. "Tube Type Micro Manipulator Using Shape Memory Alloy (SMA)," <i>Proceedings of the IEEE Sixth International Symposium on Micro Machine and Human Science</i> , Nagoya, Japan, pp. 115-120.
	Y	Ashley, S., "Smart Skis and Other Adaptive Structures", <i>Mechanical Engineering</i> , November 1995, pp. 77-81
	Z	Bar-Cohen, Yoseph, JPL, <i>WorldWide ElectroActive Polymers, EAP (Artificial Muscles) Newsletter</i> , Vol. 1, No. 1, June 1999.
	A1	Bar-Cohen, Yoseph, JPL, <i>WorldWide ElectroActive Polymers, EAP (Artificial Muscles) Newsletter</i> , Vol. 1, No. 2, December 1999.
	A2	Bar-Cohen, Yoseph, JPL, <i>WorldWide ElectroActive Polymers, EAP (Artificial Muscles) Newsletter</i> , Vol. 2, No. 1, July 2000.
	A3	Bar-Cohen, Yoseph, JPL, <i>WorldWide ElectroActive Polymers, EAP (Artificial Muscles) Newsletter</i> , Vol. 2, No. 2, December 2000.
	A4	Bar-Cohen, Yoseph, JPL, <i>WorldWide ElectroActive Polymers, EAP (Artificial Muscles) Newsletter</i> , Vol. 3, No.1, June 2001.
	A5	Bar-Cohen, Yoseph, JPL, <i>WorldWide Electroactive Polymer Actuators Webhub</i> webpages 1-7, http://ndeaa.jpl.nasa.gov/nasa-nde/lommas/eap/EAP-web.htm , downloaded July 23, 2001.
	A6	Baughman, R., L. Shacklette, R. Elsenbaumer, E. Plichta, and C. Becht "Conducting Polymer Electromechanical Actuators," <i>Conjugated Polymeric Materials: Opportunities in Electronics, Optoelectronics and Molecular Electronics</i> , eds. J.L. Bredas and R.R. Chance, Kluwer Academic Publishers, The Netherlands, pp. 559-582, 1990
	A7	Baughman, R.H., L.W. Shacklette, and R.L. Elsenbaumer, E.J. Plichta, and C. Becht, "Micro electromechanical actuators based on conducting polymers", in <i>Molecular Electronics, Materials and Methods</i> , P.I. Lazarev (ed.), Kluwer Academic Publishers, pp. 267-289 (1991)
	A8	Bharti, V., Y. Ye, T.-B. Xu and Q. M. Zhang, "Correlation Between Large Electrostrictive Strain and Relaxor Behavior with Structural Changes Induced in P(VDF-TrFE) Copolymer by electron Irradiation," <i>Mat. Res. Soc. Symp. Proc.</i> Vol 541, pp. 653-659 (1999).
	A9	Bharti, V., Z.-Y. Cheng, S. Gross, T.-B. Xu, and Q. M. Zhang, "High electrostrictive strain under high mechanical stress in electron-irradiated poly(vinylidene fluoride-trifluoroethylene) copolymer," <i>Appl. Phys. Lett.</i> Vol. 75, 2653-2655 (October 25, 1999).
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified)

Information Disclosure
Statement By Applicant

(Use Several Sheets if Necessary)

Atty.Docket No.

SRI1P029

Application No.:

09/779,373

Applicant:

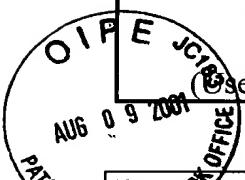
Pelrine, et al.

Filing Date

02/07/01

Group

2834



Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	B1	Bharti, V., H. S. Xu, G. Shanthi, and Q. M. Zhang, "Polarization and Structural Properties of High Energy Electron Irradiated Poly(vinylidene fluoride-trifluoroethylene) Copolymer Films," to be published in <i>J. Appl. Phys.</i> (2000).
	B2	Bharti, V., X.-Z. Zhao, Q. M. Zhang, T. Romotowski, F. Tito, and R. Ting, "Ultrahigh Field Induced Strain And Polarization Response In Electron Irradiated Poly(Vinylidene Fluoride-Trifluoroethylene) Copolymer," <i>Mat. Res. Innovat.</i> Vol. 2, 57-63 (1998).
	B3	Bobbio, S., M Kellam, B. Dudley, S. Goodwin Johansson, S. Jones, J. Jacobson, F. Tranjan, and T. DuBois, "Integrated Force Arrays," in Proc. IEEE Micro ElectroMechanical Systems Workshop, Fort Lauderdale, Florida February 1993.
	B4	Bohon, K., and S. Krause, "An Electrorheological Fluid and Siloxane Gel Based Electromechanical Actuator: Working Toward an Artificial Muscle," to be published in <i>J. Polymer Sci., Part B. Polymer Phys.</i> (2000)
	B5	Brock, D. L., "Review of Artificial Muscle based on Contractile Polymers," MIT Artificial Intelligence Laboratory, A.I. Memo No. 1330, Nov. 1991.
	B6	Caldwell, D., G. Medrano-Cerda, and M. Goodwin, "Characteristics and Adaptive Control of Pneumatic Muscle Actuators for a Robotic Elbow," Proc. IEEE Int. Conference on Robotics and Automation, San Diego, California (8-13 May 1994).
	B7	Calvert, P. and Z. Liu, "Electrically stimulated bilayer hydrogels as muscles," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA, pp. 236-241.
	B8	Cheng, Z.-Y., H. S. Xu, J. Su, Q. M. Zhjang, P.-C. Wang, and A. G. MacDiarmid, "High performance of all-polymer electrostrictive systems," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA., pp. 140-148.
	B9	Cheng, Z.-Y., T.-B. Xu, V. Bharti, S. Wang, and Q. M. Zhang, "Transverse Strain Responses In The Electrostrictive Poly(Vinylidene Fluoride-Trifluoroethylene) Copolymer," <i>Appl. Phys. Lett.</i> Vol 74, No. 13, pp. 1901-1903, March 29, 1999.
	B10	Chiarelli, P., A. Della Santa, D. DeRossi, and A. Mazzoldi. 1995. "Actuation Properties of Electrochemically Driven Polypyrrole Free-standing Films," <i>Journal of Intelligent Material Systems and Structures</i> , Vol. 6, pp. 32-37, January 1995
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified)

Information Disclosure
Statement By Applicant

(Use Several Sheets if Necessary)

Atty Docket No.

Application No.:

SRI1P029

09/779,373

Applicant:

Pelrine, et al.

Filing Date

02/07/01

Group

2834

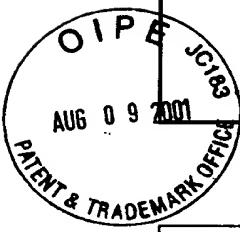


Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	C1	De Rossi, D., and P. Chiarelli. 1994. "Biomimetic Macromolecular Actuators," <i>Macro-Ion Characterization, American Chemical Society Symposium Series</i> , Vol. 548, Ch. 40, pp. 517-530.
	C2	Dowling, K., <i>Beyond Faraday-Non Traditional Actuation</i> , available on the World Wide Web at http://www.frc.ri.cmu.edu/~nivek/OTH/beyond-faraday/beyondfaraday.html , 9 pages, 1994
	C3	Egawa, S. and T. Higuchi, "Multi-Layered Electrostatic Film Actuator," Proc. IEEE Micro Electra Mechanical Systems, Napa Valley, California, pp. 166-171 (February 11-14, 1990).
	C4	Elhami, K., and B. Gauthier-Manuel, "Electrostriction Of The Copolymer Of Vinylidene-Fluoride And Trifluoroethylene," <i>J. Appl. Phys.</i> Vol. 77 (8), 3987-3990, April 15, 1995.
	C5	Flynn, Anita M., L.S. Tavrow, S.F. Bart, R.A. Brooks, D.J. Ehrlich, K.R. Udayakumar, and L.E. Cross. 1992. "Piezoelectric Micromotors for Microrobots," <i>IEEE Journal of Microelectromechanical Systems</i> , Vol.1, No.1, pp. 44-51 (March 1992); also published as <i>MIT Al Laboratory Memo 1269</i> , Massachusetts Institute of Technology (February 1991).
	C6	Full, R. J. and K. Meijer, "Artificial Muscles Versus Natural Actuators From Frogs To Flies," Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference, March 6-8, 2000, Newport Beach, California, USA, pp. 2-9.
	C7	Furuhata, T., T. Hirano, and H. Fujita, "Array-Driven Ultrasonic Microactuators," Solid State Sensors and Actuators, 1991, Digest of Tech. Papers, Transducers, pp. 1056-1059
	C8	Furukawa, T., and N. Seo., "Electrostriction as the Origin of Piezoelectricity in Ferroelectric Polymers," <i>Japanese J. Applied Physics</i> , Vol. 29, No. 4, pp. 675-680 (April 1990).
	C9	Gilbertson, R.G., and J.D. Busch. 1994. "Survey of Micro-Actuator Technologies for Future Spacecraft Missions," presented at the conference entitled "Practical Robotic Interstellar Flight: Are We Ready?" New York University and The United Nations, New York. (August 29 and September 1, 1994); also published on the World Wide Web at http://nonothinc.com/nanosci/microtech/mems/ten-actuators/gilbertson.html .
	C10	Goldberg, Lee, "Adaptive-Filtering Developments Extend Noise-Cancellation Applications, <i>Electronic Design</i> , February 6, 1995, pages 34 and 36
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

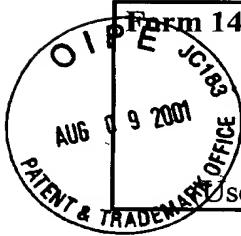
Form 1449 (Modified) Information Disclosure Statement By Applicant (Use Several Sheets if Necessary)		Atty Docket No. SRI1P029	Application No.: 09/779,373
		Applicant: Pelrine, et al.	
		Filing Date 02/07/01	Group 2834



Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	D1	M. Greene and J. A. Willett, and Kornbluh, R., "Robotic systems," in ONR Report 32198-2, Ocean Engineering and Marine Systems 1997 Program (Dec. 1997)
	D2	Heydt, R., R. Pelrine, J. Joseph, J. Eckerle, and R. Kornbluh. "Acoustical Performance of an Electrostrictive Polymer Film Loudspeaker", <i>Journal of the Acoustical Society of America</i> Vol. 107, pp. 833-839 (Feb. 2000).
	D3	Heydt, R., R. Kornbluh, R. Pelrine, and B. Mason, "Design and Performance of an Electrostrictive Polymer Film Acoustic Actuator", <i>Journal of Sound and Vibration</i> (1998)215(2), 297-311.
	D4	Hirano, M., K. Yanagisawa, H. Kuwano, and S. Nakano, "Microvalve with Ultra-low Leakage," Tenth Annual International Workshop on Micro Electromechanical Systems, Nagoya, Japan, <i>IEEE Proceedings</i> (January 26-30, 1997), pp. 323-326.
	D5	Hirose, S., Biologically Inspired Robots: Snake-like Locomotors and Manipulators, "Development of the ACM as a Manipulator", Oxford University Press, New York, 1993, pp.170-172.
	D6	Hunter, I., S. Lafontaine, J. Hollerbach, and P. Hunter, "Fast Reversible NiTi Fibers for Use in MicroRobotics," <i>Proc. 1991 IEEE Micro Electro Mechanical Systems-MEMS '91</i> , Nara, Japan, pp.166-170.
	D7	Hunter, I.W., and S. Lafontaine, "A Comparison of Muscle with Artificial Actuators", <i>Technical Digest of the IEEE Solid-state Sensor and Actuator Workshop</i> , Hilton Head, South Carolina, June 22-25, 1992, pp.178-185.
	D8	Jacobsen, S., Price, R., Wood, J, Rytting, T., and Rafaelof, M., "A Design Overview of an Eccentric-Motion Electrostatic Microactuator (the Wobble Motor)", <i>Sensors and Actuators</i> , 20 (1989) pages 1-16
	D9	Kaneto, K., M. Kaneko, Y. Min, and A.G. MacDiarmid. 1995. "Artificial Muscle": Electromechanical Actuators Using Polyaniline Films," <i>Synthetic Metals</i> 71, pp. 2211-2212, 1995
	D10	Kawamura, S., K. Minani, and M. Esashi, "Fundamental Research of Distributed Electrostatic Micro Actuator," <i>Technical Digest of the 11th Sensor Symposium</i> , pp. 27-30(1992).
	D11	Kondoh Y., and T. Ono. 1991. "Bimorph Type Actuators using Lead Zinc Niobate-based Ceramics," <i>Japanese Journal of Applied Physics</i> , Vol. 30, No. 9B, pp. 2260-2263, September 1991.
	D12	Kornbluh, R., R. Pelrine, R. Heydt, and Q. Pei, "Acoustic Actuators Based on the Field-Activated Deformation of Dielectric Elastomers," (2000)
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



Form 1449 (Modified)

**Information Disclosure
Statement By Applicant**

(Use Several Sheets if Necessary)

Atty Docket No.

SRI1P029

Application No.:

09/779,373

Applicant:

Pelrine, et al.

Filing Date

02/07/01

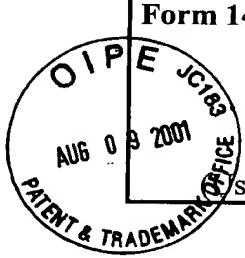
Group

2834

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	E1	Kornbluh, R., G. Andeen, and J. Eckerle, "Artificial Muscle: The Next Generation of Robotic Actuators," presented at the Fourth World Conference on Robotics Research, SME Paper M591-331, Pittsburgh, PA, September 17-19, 1991.
	E2	Kornbluh, R., R. Pelrine, J. Joseph, "Elastomeric Dielectric Artificial Muscle Actuators for Small Robots," <i>Proceedings of the Third IASTED International Conference on Robotics and Manufacturing</i> , June 14-16, 1995, Cancun, Mexico.
	E3	Kornbluh, R., Pelrine, R., Eckerle, J., Joseph, J., "Electrostrictive Polymer Artificial Muscle Actuators", IEEE International Conference on Robotics and Automation, Leuven, Belgium, 1998
	E4	Kornbluh, R., R. Pelrine, Jose Joseph, Richard Heydt, Qibing Pei, Seiki Chiba, 1999. "High-Field Electrostriction Of Elastomeric Polymer Dielectrics For Actuation", Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA. pp. 149-161.
	E5	Kornbluh, R. D and R. E. Pelrine., "Dexterous Multiarticulated Manipulator with Electrostrictive Polymer Artificial Muscle," ITAD-7247-QR-96-175, SRI Project Number 7247, Prepared for: Office of Naval Research, November 1996
	E6	Kornbluh, R., R. Pelrine, Q. Pei, S. Oh, and J. Joseph, 2000. "Ultrahigh Strain Response of Field-Actuated Elastomeric Polymers," Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference, March 6-8, 2000, Newport Beach, California, USA, pp. 51-64.
	E7	Kornbluh, R., Pelrine, R. Joseph, J., Pei, Q. and Chiba, S., "Ultra-High Strain Response of Elastomeric Polymer Dielectrics", Proc. Materials Res. Soc., Fall meeting, Boston, MA, pages 1-12, December 1999
	E8	Ktech's PVDF Sensors, http://www.ktech.com/pvdf.htm , 06/06/2001, pp. 1-5.
	E9	Lang, J. M. Schlect, and R. Howe, "Electric Micromotors: Electromechanical Characteristics," Proc. IEEE Micro Robots and Teleoperators Workshop, Hyannis, Massachusetts (November 9-11, 1987).
	E10	Liu, Y., T. Zeng, Y.X. Wang, H. Yu, and R. Claus, "Self-Assembled Flexible Electrodes on Electroactive Polymer Actuators," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA., pp. 284-288.
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



Form 1449 (Modified)		Atty Docket No. SRI1P029	Application No.: 09/779,373
Information Disclosure Statement By Applicant		Applicant: Pelrine, et al.	
(Use Several Sheets if Necessary)		Filing Date 02/07/01	Group 2834

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	F1	Liu, C., Y. Bar-Cohen, and S. Leary, "Electro-statically stricted polymers (ESSP)," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA., pp. 186-190.
	F2	Lawless, W. and R. Arenz, "Miniature Solid-state Gas Compressor," <i>Rev. Sci Instrum.</i> , 58(8), pp.1487-1493, August 1987
	F3	Martin, J. and R. Anderson, 1999. "Electrostriction In Field-Structured Composites: Basis For A Fast Artificial Muscle?", <i>Journal of Chemical Physics</i> , Vol. 111, no. 9, pp.4273-4280, September 1, 1999
	F4	Measurements Specialties, Inc. – Piezo Home, http://www.msiusa.com/piezo/index.htm , 06/06/2001.
	F5	T. B. Nguyen, C. K. DeBolt, Shastri, S. V., and A. Mann, "Advanced Robotic Search," in ONR Ocean, Atmosphere, and Space Fiscal Year 1999 Annual Reports (Dec. 1999)
	F6	Nguyen, T., J. A. Willett and Kornbluh, R., "Robotic systems," in ONR Ocean, Atmosphere, and Space Fiscal Year 1998 Annual Reports (Dec. 1998)
	F7	Nguyen, T., Green, M., and Kornbluh, R., "Robotic Systems," in ONR Ocean, Atmosphere, and Space Fiscal Year 1999 Annual Reports (Dec. 1999)
	F8	Ohara, K., M. Hennecke, and J. Fuhrmann, "Electrostriction of polymethylmethacrylates," <i>Colloid & Polymer Sci.</i> Vol 280, 164-168 (1982).
	F9	Olsson, A., O. Larsson, J. Holm, L. Lundbladh, O. Ohinan, and G. Stemme. 1997. "Valve-less Diffuser Micropumps Fabricated using Thermoplastic Replication," <i>Proc. IEEE Micro Electro Mechanical Systems</i> , Nagoya, Japan, pp. 305-310 (January 26-30, 1997).
	F10	Olsson, A., G. Stemme, and E. Stemme, "The First Valve-less Diffuser Gas Pump," Tenth Annual International Workshop on Micro Electromechanical Systems, Nagoya, Japan, <i>IEEE Proceedings</i> (January 26-30, 1997), pp.108-113.
	F11	Otero, T.F., J. Rodriguez, E. Angulo and C. Santamaria, "Artificial Muscles from Bilayer Structures," <i>Synthetic Metals</i> , Vol. 55-57, pp. 3713-3717 (1993).
	F12	Otero, T.F., J. Rodriguez, and C. Santamaria, "Smart Muscle Under Electrochemical Control of Molecular Movement in Polypyrrole Films," <i>Materials Research Society Symposium Proceedings</i> , Vol. 330, pp. 333-338, 1994
	F13	Park, S.E., and T. Shrout., "Ultrahigh Strain and Piezoelectric Behavior in Relaxor Based Ferroelectric Single Crystals," <i>J Applied Physics</i> , Vol. 82, pp. 1804-1811, August 15, 1997
Examiner		Date Considered

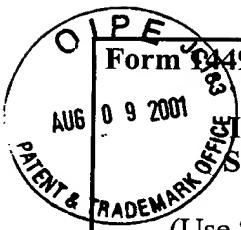
Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<p style="text-align: center;">Form 1449 (Modified)</p> <p style="text-align: center;">Information Disclosure Statement By Applicant</p> <p style="text-align: center;">Use Several Sheets if Necessary)</p>		Atty Docket No. SRI1P029	Application No.: 09/779,373
		Applicant: Pelrine, et al.	
		Filing Date 02/07/01	Group 2834

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	G1	Pei, Q., O. Inganäs, and I. Lundström, "Bending Bilayer Strips Built From Polyaniline For Artificial Electrochemical Muscles," <i>Smart Materials and Structures</i> , Vol.2, pp. 16., January 22, 1993
	G2	Pei <i>et al.</i> , "Improved Electroactive Polymers", U.S. Patent Application No. 09/619,847, filed July 20, 2000, 70 pages
	G3	R. Pelrine and Kornbluh, R., and. 1995. "Dexterous Multiarticulated Manipulator with Electrostrictive Polymer Artificial Muscle Actuator," EMU 95-023, SRI International, Menlo Park, California, April 28, 1995.
	G4	Pelrine, R., R. Kornbluh, and Q. Pei. "Electroactive Polymer Transducers And Actuators", U.S. Patent Application No. 09/620,025, filed July 20, 2001, 58 pages.
	G5	Pelrine, R. and Kornbluh, "Electroactive Polymer Devices", U.S. Patent Application No. 09/619,846, filed July 20, 2000, 67 pages
	G6	Pelrine <i>et al.</i> , "Electroactive Polymer Electrodes", U.S. Patent Application No. 09/619,843, filed July 20, 2000, 54 pages
	G7	Pelrine <i>et al.</i> , "Electroactive Polymer Fabrication", U.S. Patent Application No. 09/619,845, filed July 20, 2000, 55 pages
	G8	Pelrine <i>et al.</i> , "Electroactive Polymer Generators", U.S. Patent Application No. 09/619,848, filed July 20, 2000, 69 pages
	G9	Pelrine, R., R. Kornbluh, and J. Joseph, "Electrostriction of Polymer Dielectrics with Compliant Electrodes as a Means of Actuation," <i>Sensors and Actuators A: Physical</i> , Vol. 64, 1998, pp.77-85.
	G10	Pelrine, R, R. Kornbluh, J. Joseph, and S. Chiba, "Electrostriction of Polymer Films for Microactuators," <i>Proc. IEEE Tenth Annual International Workshop on Micro Electro Mechanical Systems</i> , Nagoya, Japan, January 26-30, 1997, pp. 238-243.
	G11	Pelrine, R., R. Kornbluh, and J. Eckerle. "Monolithic Electroactive Polymers", U.S. Patent Application No. 09/779,203, filed February 7, 2001.
	G12	Pelrine, R., and J. Joseph, <i>FY 1992 Final Report on Artificial Muscle for Small Robots</i> , ITAD-3393-FR-93-063, SRI International, Menlo Park, California, March 1993
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



Form 1449 (Modified)

Information Disclosure
Statement By Applicant

(Use Several Sheets if Necessary)

Atty Docket No.

SRI1P029

Applicant:

Pelrine, et al.

Filing Date

02/07/01

Application No.:

09/779,373

Group

2834

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	H1	Pelrine, R., and J. Joseph. 1994. <i>FY 1993 Final Report on Artificial Muscle for Small Robots</i> , ITAD-4570-FR-94-076, SRI International, Menlo Park, California.
	H2	Pelrine, R., R. Kornbluh, and J. Joseph, <i>FY 1994 Final Report on Artificial Muscle for Small Robots</i> , ITAD-5782-FR-95-050, SRI International, Menlo Park, California, 1995
	H3	Pelrine, R., R. Kornbluh, and J. Joseph, <i>FY 1995 Final Report on Artificial Muscle for Small Robots</i> , ITAD-7071 -FR-96-047, SRI International, Menlo Park, California, 1996
	H4	Pelrine, R., R. Kornbluh, and J. Joseph, <i>FY 1996 Final Report on Artificial Muscle for Small Robots</i> , ITAD-7228-FR-97-058, SRI International, Menlo Park, California, 1997
	H5	Pelrine, R., R. Kornbluh, and J. Joseph, <i>FY 1997 Final Report on Artificial Muscle for Small Robots</i> , ITAD-1612-FR-98-041, SRI International, Menlo Park, California, 1998
	H6	Pelrine, R., R. Kornbluh, and J. Joseph, <i>FY 1998 Final Report on Artificial Muscle for Small Robots</i> , ITAD-3482-FR-99-36, SRI International, Menlo Park, California, 1999
	H7	Pelrine, R., R. Kornbluh, and J. Joseph, <i>FY 1999 Final Report on Artificial Muscle for Small Robots</i> , ITAD-10162-FR-00-27, SRI International, Menlo Park, California, 2000
	H8	Pelrine, R., R. Kornbluh, Q. Pei, and J. Joseph. "High-Speed Electrically Actuated Elastomers with Strain Greater Than 100%", <i>Science</i> , Reprint Series, Feb. 4 2000, Vol. 287, pp. 836-839.
	H9	Pelrine, R., R. Kornbluh, Q. Pei, and J. Joseph, "High Speed Electrically Actuated Elastomers with Over 100% Strain," <i>Science</i> , Vol. 287, No. 5454, pages 1-21, 2000
	H10	Pelrine, R., R. Kornbluh, and G. Kofod, "High Strain Actuator Materials Based on Dielectric Elastomers," submitted to <i>Advanced Materials</i> (May 2000).
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Form 1449 (Modified)

Information Disclosure
Statement By Applicant

(Use Several Sheets if Necessary)

Atty Docket No.

SRI1P029

Applicant:

Pelrine, et al.

Filing Date

02/07/01

Application No.:

09/779,373

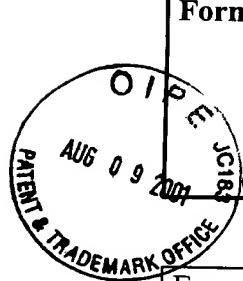
Group

2834

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	I1	Pelrine, R., Roy Kornbluh, Jose Joseph, Qibing Pei, Seiki Chiba "Recent Progress in Artificial Muscle Micro Actuators," , SRI International, Tokyo, 1999 MITI/NEEDOIMNIC, 1999
	I2	Pelrine, R., J. Eckerle, and S. Chiba, "Review of Artificial Muscle Approaches," invited paper, in <i>Proc. Third International Symposium on Micro Machine and Human Science</i> , Nagoya, Japan, October 14-16, 1992
	I3	Piezoflex™ PVDF Polymer Sensors, http://www.airmar.com/piezo/pvdf.htm , 06/06/2001.
	I4	Scheinbeim, J., B. Newman, Z. Ma, and J. Lee, "Electrostrictive Response of Elastomeric Polymers," <i>ACS Polymer Preprints</i> , 33(2), pp.385-386, 1992
	I5	Schlaberg, H. I., and J. S. Duffy, "Piezoelectric Polymer Composite Arrays For Ultrasonic Medical Imaging Applications," <i>Sensors and Actuators</i> , A 44, pp. 111-117, February 22, 1994
	I6	Shahinpoor, M., "Micro-electro-mechanics of Ionic Polymer Gels as Electrically Controllable Artificial Muscles," <i>J. Intelligent Material Systems and Structures</i> , Vol. 6, pp. 307-314, May 1995
	I7	Shkel, Y., and D. Klingenberg, "Material Parameters for Electrostriction," <i>J Applied Physics</i> , Vol. 80(8), pp. 4566-4572, October 15, 1996
	I8	Smela, E., O. Inganäs, and I. Lundström, "Controlled Folding of Micrometer-size Structures," <i>Science</i> , Vol. 268, pp. 1735-1738 (23 June 1995).
	I9	Smela, E., O. Inganäs, Q. Pei, and I. Lundström, "Electrochemical Muscles: Micromachining Fingers and Corkscrews," <i>Advanced Materials</i> , Vol.5, No. 9, pp.630-632, September 1993
	I10	Su, J., Q. M. Zhang, C. H. Kim, R. Y. Ting, and R. Capps, "Effects of Transitional Phenomena on the Electric Field induced Strain-electrostrictive Response of a Segmented Polyurethane Elastomer," pp. 1363-1370, January 20, 1997.
	I11	Su, J., Z. Ounaies, J. S. Harrison, Y. Bara-Cohen and S. Leary, "Electromechanically Active Polymer Blends for Actuation," Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference, March 6-8, 2000, Newport Beach, California, USA, pp. 65-72.
	I12	Technology, http://www.micromuscle.com/html/technology.html , 06/06/2001.
	I13	Tobushi, H., S. Hayashi, and S. Kojima, "Mechanical Properties of Shape Memory Polymer of Polyurethane Series," in <i>JSME International Journal</i> , Series I, Vol.35, No.3, 1992
	I14	Treloar, L.R.G, "Mechanics of Rubber Elasticity," <i>J Polymer Science, Polymer Symposium</i> , No. 48, pp. 107-123, 1974
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



Form 1449 (Modified)		Atty Docket No. SRI1P029	Application No.: 09/779,373
Information Disclosure Statement By Applicant		Applicant: Pelrine, et al.	
(Use Several Sheets if Necessary)		Filing Date 02/07/01	Group 2834

Other Documents

Examiner Initial	No.	Author, Title, Date, Place (e.g. Journal) of Publication
	J1	Uchino, K. 1986. "Electrostrictive Actuators: Materials and Applications," <i>Ceramic Bulletin</i> , 65(4), pp. 647-652, 1986
	J2	Wade, W. L., Jr., R. J. Mammone and M. Binder, "Increased Dielectric Breakdown Strengths Of Melt-Extruded Polypropylene Films," <i>Polymer</i> , Vol. 34, No. 5, pp. 1093-4 (1993).
	J3	Wax, S. G. and R. R. Sands, "Electroactive Polymer Actuators and Devices," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA., pp. 2-10.
	J4	Winters, J., "Muscle as an Actuator for Intelligent Robots", Robotics Research: Trans. Robotics International of SME, Scottsdale, AZ (August 18 - 21, 1986).
	J5	Yam, P., "Plastics Get Wired", <i>Scientific American</i> , Vol. 273, pp. 82-87, July 1995
	J6	Zhang, Q. M., V. Bharti, Z.-Y. Cheng, T.-B. Xu, S. Wang, T. S. Ramotowski, F. Tito, and R. Ting, "Electromechanical Behavior of Electroactive P(VDF-TrFE) Copolymers," Proceedings of the SPIE International Symposium on Smart Structures and Materials: Electro-Active Polymer Actuators and Devices, March 1-2, 1999, Newport Beach, California, USA., pp. 134-139.
	J7	Zhang, Q., V. Bharti, and X. Zhao, "Giant Electrostriction and Relaxor Ferroelectric Behavior in Electron-irradiated Poly(vinylidene fluoride-trifluoroethylene) Copolymer," <i>Science</i> , Vol. 280, pp. 2101-2104 (26 June 1998).
	J8	Zhang, Q. M., Z.-Y. Cheng, V. Bharti, T.-B. Xu, H. Xu, T. Mai, and S. J. Gross, "Piezoelectric And Electrostrictive Polymeric Actuator Materials," Proceedings of the 7th SPIE Symposium on Smart Structures and Materials-Electroactive Polymers and Devices (EAPAD) Conference, March 6-8, 2000, Newport Beach, California, USA, pp. 34-50.
	J9	Zhenyi, M., J.I. Scheinbeim, J.W. Lee, and B.A. Newman. 1994. "High Field Electrostrictive Response of Polymers," <i>Journal of Polymer Sciences, Part B-Polymer Physics</i> , Vol.32, pp. 2721-2731, 1994
Examiner		Date Considered

Examiner: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant